

**WHAT IS CLAIMED IS:**

1           1.       A method for connecting component-side pad electrodes and  
2       substrate-side pad electrodes when a surface-mount component is mounted onto  
3       the substrate, wherein the component-side pad electrodes are formed on the  
4       surface of the component opposed to a substrate, solder bumps are formed on the  
5       component-side pad electrodes, and substrate-side pad electrodes are formed on  
6       the surface of the substrate, the method comprising:

7                 arranging the substrate-side pad electrodes inside a component-  
8       corresponding region which corresponds to the plan view of the surface-mount  
9       component;

10                setting the length of each of the substrate-side pad electrodes in the  
11       direction substantially perpendicular to the outer edge of the component-  
12       corresponding region larger than the length of the corresponding component-side  
13       pad electrode in the direction substantially perpendicular to the outer edge of the  
14       surface-mount component;

15                placing the surface-mount component on the substrate so that each of the  
16       solder bumps are opposed to a predetermined substrate-side pad electrode; and

17                melting the solder bumps by heating to connect each of the component-  
18       side pad electrodes to one of the substrate-side pad electrodes through the solder.

1           2.       A method for connecting pad electrodes in accordance with  
2       claim 1, wherein the width of each of said component-side pad electrodes and the  
3       width of the solder bump on each of said component-side pad electrodes are larger  
4       than the width of each of said substrate-side pad electrodes.

1           3.       A method for inspecting the connection state of pad electrodes  
2       comprising the steps of:  
3                 connecting the pad electrodes by a connection method in accordance with  
4       claim 1;

5           detecting the shapes of the solder after each of said solder bumps has  
6    been melted and flowed on one of said substrate-side pad electrodes by a  
7    nondestructive inspection; and  
8           making a pass/fail discrimination of the connection state between each of  
9    the component-side pad electrodes and one of the substrate-side pad electrodes.

1           4.     A method for inspecting the connection state of pad electrodes  
2    comprising the steps of:  
3           connecting the pad electrodes by a connection method in accordance with  
4    claim 2;  
5           detecting the shapes of the solder after each of said solder bumps has  
6    been melted and flowed on one of said substrate-side pad electrodes by a  
7    nondestructive inspection; and  
8           making a pass/fail discrimination of the connection state between each of  
9    the component-side pad electrodes and one of the substrate-side pad electrodes.

1           5.     A method for inspecting the connection state of the pad electrodes  
2    comprising the steps of:  
3           connecting the pad electrodes by a connection method in accordance with  
4    claim 1;  
5           obtaining an X-ray transmission image by radiating X rays from the back  
6    surface side of said substrate; and  
7           detecting the shape of solder after each of said solder bumps has been  
8    melted and flowed on one of said substrate-side pad electrodes, from the obtained  
9    X-ray transmission image; and  
10          making a pass/fail discrimination of the connection state between each of  
11    the component-side pad electrodes and one of the substrate-side pad electrodes.

1           6.       A method for inspecting the connection state of the pad electrodes  
2       comprising the steps of:  
3               connecting the pad electrodes by a connection method in accordance with  
4       claim 2;  
5               obtaining an X-ray transmission image by radiating X rays from the back  
6       surface side of said substrate; and  
7               detecting the shape of solder after each of said solder bumps has been  
8       melted and flowed on one of said substrate-side pad electrodes, from the obtained  
9       X-ray transmission image; and  
10              making a pass/fail discrimination of the connection state between each of  
11       the component-side pad electrodes and one of the substrate-side pad electrodes.

1           7.       A connection structure comprising:  
2               a substrate having a surface and substrate-side pad electrodes formed on  
3       the substrate surface;  
4               a surface-mount component having a surface and component-side pad  
5       electrodes formed on the surface, the surface being opposed to the substrate with  
6       each component-side pad electrode opposed to one of the substrate-side pad  
7       electrodes;  
8               wherein the substrate-side pad electrodes are arranged inside a  
9       component-corresponding region, the length of each of the substrate-side pad  
10       electrodes being larger than that of the corresponding component-side pad  
11       electrode, and wherein each of the component-side pad electrodes is connected to  
12       the corresponding substrate-side pad electrode by a solder which has flowed  
13       between the component-side pad electrodes and the substrate-side pad electrodes  
14       by melting of a solder bump.

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- 1                   8.       A connection structure between the pad electrodes in accordance
- 2       with claim 7, wherein the width of each of said component-side pad electrodes is
- 3       set to be larger than the width of each of said substrate-side pad electrodes.

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